

AMENDMENTS TO THE CLAIMS:

Please cancel claims 6, 7, and 14, without prejudice or disclaimer of their subject matter, and amend claims 5, 8-10, 13, 15, and 17 as indicated below. This listing of claims will replace all prior versions and listings of claims in the application:

1. (Withdrawn) A semiconductor device comprising:
a semiconductor substrate;
source/drain regions formed in the semiconductor substrate;
a gate insulating film formed on a channel region between the source/drain regions;
a gate electrode formed on the gate insulating film; and
a sidewall insulating film formed on a sidewall surface of the gate electrode,
wherein the gate electrode is made of SiGe, the sidewall insulating film is an insulating film obtained by oxidizing the sidewall surface of the gate electrode, and the sidewall insulating film contains silicon oxide as a main component.
2. (Withdrawn) The semiconductor device according to claim 1, wherein a composition ratio of Ge/Si of the sidewall insulating film is lower than a composition ratio of Ge/Si of the gate electrode.
3. (Withdrawn) A semiconductor device comprising:
a semiconductor substrate in which a SiGe monocrystal layer is formed;

source/drain regions formed in the semiconductor substrate;
a gate insulating film formed on a channel region between the source/drain regions; and
a gate electrode formed on the gate insulating film,
wherein the channel region is formed of the SiGe monocrystal layer, the gate insulating film is an insulating film obtained by oxidizing a surface of the SiGe monocrystal layer, and the gate insulating film is made of silicon oxide as a main component.

4. (Withdrawn) The semiconductor device according to claim 3, wherein a composition ratio of Ge/Si of the gate insulating film is lower than a composition ratio of Ge/Si of the SiGe monocrystal layer.

5. (Currently Amended) A method of manufacturing a semiconductor device, comprising:

forming an insulating film on a semiconductor substrate;
forming a conductive film made of ~~a first semiconductor and a second semiconductor~~ Si and Ge on the insulating film; and

thermal-oxidizing the conductive film in an atmosphere that contains an oxidant for oxidizing ~~the first semiconductor~~ Si and Ge and a reductant for reducing ~~the second semiconductor~~ Si and Ge, to form an oxide film made of ~~the first semiconductor~~ Si on the conductive film, wherein a partial pressure ratio of the oxidant to the reductant is

larger than a partial pressure ratio of SiO₂ under equilibrium and smaller than a partial pressure ratio of GeO₂ under equilibrium.

6-7. (Canceled)

8. (Currently Amended) The method of manufacturing a semiconductor device, according to claim 7 5, wherein the oxidant for oxidizing Si is H₂O, the reductant for reducing Ge is H₂, a temperature in the thermal-oxidizing is in a range of from 0°K to 2,500°K, and the atmosphere has a partial pressure ratio between a characteristic curve of equilibrium vapor-hydrogen partial pressure characteristics of GeO₂ and a characteristic curve of equilibrium vapor-hydrogen partial pressure characteristics of SiO₂ within a range of a partial pressure ratio (P_{H_2O}/P_{H_2}) of H₂O to H₂ in 10⁻¹ to 10⁻²¹.

9. (Currently Amended) The method of manufacturing a semiconductor device, according to claim 7 5, wherein the oxidant for oxidizing Si is at least one of H₂O and CO₂, and the reductant for reducing Ge is at least one of H₂ and CO.

10. (Currently Amended) A method of manufacturing a semiconductor device comprising:

forming source/drain regions formed in a semiconductor substrate;

forming a gate insulating film on a channel region between the source/drain regions;

forming a gate electrode made of SiGe on the gate insulating film; and

thermal-oxidizing the gate electrode in an atmosphere that contains an oxidant for oxidizing Si and Ge and a reductant for reducing Si and Ge to form a sidewall ~~insulating oxide film of Si~~ on a sidewall surface of the gate electrode, wherein a partial pressure ratio of the oxidant to the reductant is larger than a partial pressure ratio of SiO₂ under equilibrium and smaller than a partial pressure ratio of GeO₂ under equilibrium.

11. (Original) The method of manufacturing a semiconductor device, according to claim 10, wherein the oxidant for oxidizing Si is H₂O, the reductant for reducing Ge is H₂, a temperature in the thermal-oxidizing is in a range of from 0°K to 2,500°K, and the atmosphere has a partial pressure ratio between a characteristic curve of equilibrium vapor-hydrogen partial pressure characteristics of GeO₂ and a characteristic curve of equilibrium vapor-hydrogen partial pressure characteristics of SiO₂ within a range of a partial pressure ratio (P_{H_2O}/P_{H_2}) of H₂O to H₂ in 10⁻¹ to 10⁻²¹.

12. (Previously presented) The method of manufacturing a semiconductor device, according to claim 10, wherein the oxidant for oxidizing Si is at least one of H₂O and CO₂, and the reductant for reducing Ge is at least one of H₂ and CO.

13. (Currently Amended) A method of manufacturing a semiconductor device, comprising:

forming a monocrystal layer made of ~~at least two kinds of semiconductors~~ Si and Ge on a semiconductor substrate; and

thermal-oxidizing the monocrystal layer in an atmosphere that contains an oxidant for oxidizing Si and Ge and a reductant for reducing Si and Ge ~~as an oxidation seed~~ to form an oxide film made of one of ~~said at least two kinds of semiconductors~~ Si and Ge on a surface of the monocrystal layer, wherein a partial pressure ratio of the oxidant to the reductant is larger than a partial pressure ratio of SiO₂ under equilibrium and smaller than a partial pressure ratio of GeO₂ under equilibrium.

14. (Canceled)

15. (Currently Amended) The method of manufacturing a semiconductor device, according to claim 44 13, wherein the oxidant for oxidizing Si is H₂O, the reductant for reducing Ge is H₂, the temperature in the thermal-oxidizing is in a range of from 0°K to 2,500°K, and the atmosphere has a partial pressure ratio between a characteristic curve of equilibrium vapor-hydrogen partial pressure characteristics of GeO₂ and a characteristic curve of equilibrium vapor-hydrogen partial pressure characteristics of SiO₂ within a range of a partial pressure ratio (P_{H_2O}/P_{H_2}) of H₂O to H₂ in 10⁻¹ to 10⁻²¹.

16. (Previously presented) The method of manufacturing a semiconductor device, according to claim 13, wherein the oxidant is at least one of H₂O and CO₂, and the reductant is at least one of H₂ and CO.

17. (Currently Amended) A method of manufacturing a semiconductor device comprising:

forming an SiGe monocrystal layer including a channel region on a semiconductor substrate;

forming source/drain regions in the SiGe monocrystal layer formed on the semiconductor substrate;

forming a gate insulating film on the channel region between the source/drain regions; and

forming a gate electrode on the gate insulating film,

wherein the gate insulating film is formed on a surface of the SiGe monocrystal layer by thermal-oxidizing the SiGe monocrystal layer in an atmosphere that contains an oxidant for oxidizing Si and Ge, and a reductant for reducing Si and Ge, and the gate insulating film is made of substantially silicon oxide of Si of the SiGe monocrystal layer, wherein a partial pressure ratio of the oxidant to the reductant is larger than a partial pressure ratio of SiO₂ under equilibrium and smaller than a partial pressure ratio of GeO₂ under equilibrium.

18. (Original) The method of manufacturing a semiconductor device, according to claim 17, wherein the oxidant for oxidizing Si is H₂O, the reductant for reducing Ge is H₂, a temperature in the thermal-oxidizing is in a range of from 0°K to 2,500°K, and the atmosphere has a partial pressure ratio between a characteristic curve of equilibrium vapor-hydrogen partial pressure characteristics of GeO₂ and a characteristic curve of equilibrium vapor-hydrogen partial pressure characteristics of SiO₂ within a range of a partial pressure ratio (P_{H₂O}/P_{H₂}) of H₂O to H₂ in 10⁻¹ to 10⁻²¹.

19. (Previously presented) The method of manufacturing a semiconductor device, according to claim 17, wherein the oxidant for oxidizing Si is at least one of H₂O and CO₂, and the reductant for reducing Ge is at least one of H₂ and CO.

20. (Canceled)